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COLONY OF SINGAPORE

BOTANIC GARDENS DEPARTMENT ANNUAL REPORT FOR 1951

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BY

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Director, Botanical Gardens,
Singapore

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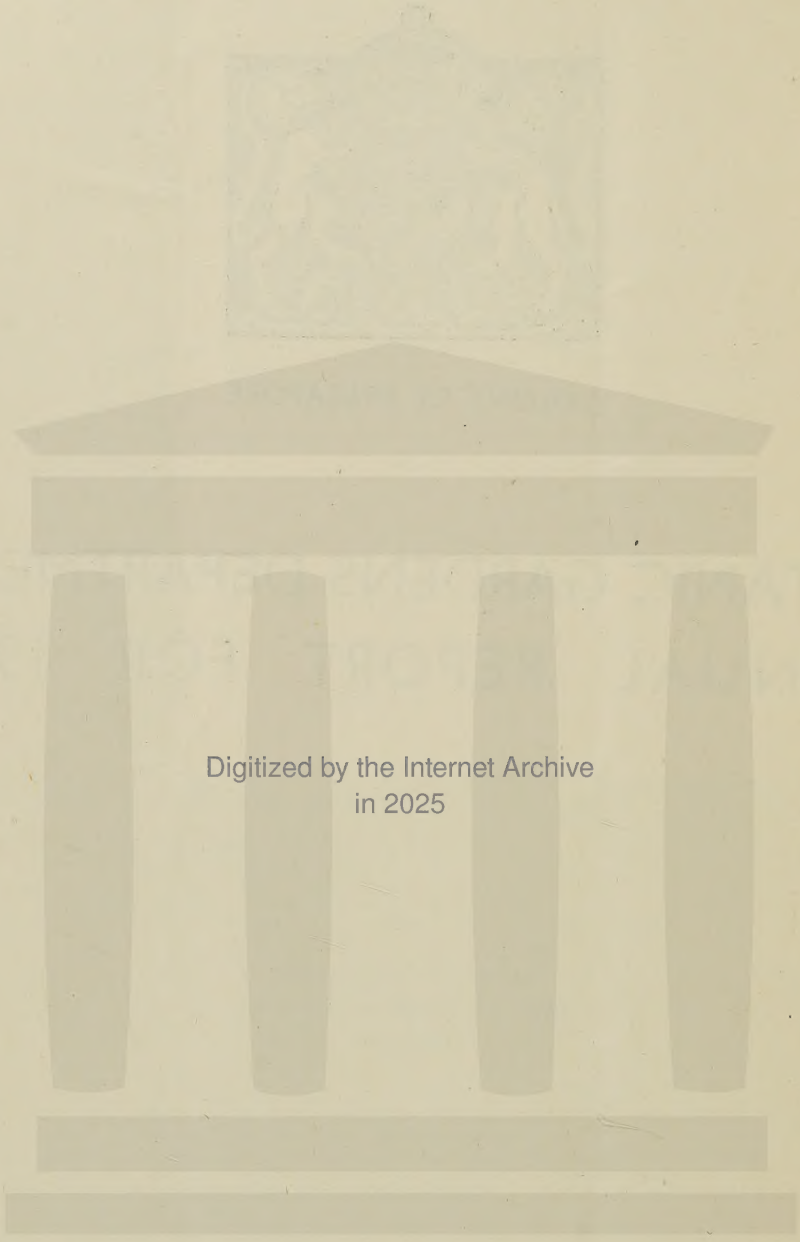

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STAFF

THE Director, Mr. M. R. Henderson, was on leave from May until September. Mr. J. Sinclair, Curator of the Herbarium, acted as Director during that time. The appointment of Assistant Director has still not been filled. Mr. J. Ewart continued to supervise the work of the Agricultural Department in addition to his own duties as Curator, Gardens. Mr. G. H. Addison, Curator, Parks, returned from vacation leave in May.

The average daily attendance of the labour force was 75 in the Gardens, 57 at Government House Domain and 9 in the Reserves. There was no serious illness amongst them.

BOTANICAL WORK IN 1951

As in the previous two years it is disappointing to have to report the impossibility of undertaking field work on any extended scale, both because of emergency conditions in the Federation and to a lesser extent because of the shortage of senior staff. Mr. J. Sinclair revisited Penang for a month in October and was greatly assisted by Mr. Ritchings and the staff of the Waterfall Gardens, Penang. His visit resulted in the discovery of fourteen species of plants not previously recorded from Penang, of which four are new records for Malaya. Another plant, *Embelia macrocarpa*, was collected for the second time in the same locality that Curtis obtained it in 1887. Mr. Sinclair continued collecting on Singapore Island, demonstrating once more that, even in a well-known area, repeated visits in all seasons of the year will reveal new material. He obtained five new records for the island during the year: *Polyalthia Hookeriana, Centipeda minima, Portulaca pilosa, Olax* sp. and *Nephelium* sp. The Centipeda and Portulaca are introduced weeds, the former common in fallow ricefields in India, Siam and North Malaya, the latter no doubt introduced by Chinese, who use it medicinally. The Olax may be *Olax rosea*, a species known from Sarawak. Other interesting plants found by Mr. Sinclair on Singapore Island include *Brownlowia lanceolata*, found at Ulu Pandan, known many years ago from Kranji and Geylang, but probably extinct in both these localities; and *Artocarpus anisophyllus*, a handsome tree found near Seletar Reservoir, which was previously known in Singapore only from a single tree in the Botanic Gardens.

Dr. C. X. Furtado, Assistant Botanist, continued his work on Dæmonorops, a genus of climbing palms or rattans. Old collections of this genus are often badly muddled, due to the variation in the species and to the lack of knowledge of them on the part of the collectors, so that it is not uncommon to find parts of two or more species mounted on the same sheet. The fragmentary nature of some collections is also a great hindrance to the proper understanding of the species. Twenty-nine species of Dæmonorops are now recognised from Malaya. Dr. Furtado also continued to help in the indexing of references to Malayan systematic and economic botany in foreign periodicals and in writing up references on herbarium sheets, a procedure

which is helpful and time saving to those engaged in the study of any group. Dr. Furtado was also engaged in keeping up to date the nomenclature of plants cultivated in the Gardens, especially of those that furnish seed sent to other institutions.

THE HERBARIUM

The amount of material sent out on loan, especially to specialists working for Flora Malesiana, increased considerably over the 1950 figures, the total being 4,891 sheets, sent to botanical institutions in Leyden, Bogor, Kew, Paris and Hawaii. 2,851 duplicates were received in exchange, the most important accessions being those from the Herbarium Bogoriense in Indonesia and from the National Museum in Manila. Contributions were received also from the Forest Department, North Borneo, and from the Department of Agriculture, New Guinea, this last being a welcome addition, as the Singapore Herbarium, except for the large Carr collection, is poor in material from this region.

The Gammexane insecticide mentioned in last year's report as being used against insect attack in the Herbarium, has not proved entirely satisfactory. A slight attack of 'herbarium beetle' was discovered in the 'Gardens Herbarium', which is a separately housed collection of cultivated plants, and a programme of repoisoning with corrosive sublimate of the whole of this collection was begun.

PUBLICATIONS

Volume XIII, part 2, of the *Gardens' Bulletin* was published in September. This was a mixed number containing papers by Professor R. E. Holttum, Mr. J. Sinclair and Dr. C. X. Furtado. Prof. Holttum described a new Vanilla from Johore and published a revision of the family Marantaceæ. Mr. Sinclair published the description of a new species of Knema, one of the Myristicaceæ, found in South Johore and Singapore. Dr. Furtado contributed a revision of six genera of Malayan climbing palms in which three new species were described.

The third part of Mr. M. R. Henderson's *Malayan Wild Flowers* was published by the Malayan Nature Society, completing the account of the Dicotyledons.

The fourth booklet in the series *Malayan Garden Plants* was published, containing illustrations and descriptions of ten climbers.

HORTICULTURAL WORK

The Gardens were maintained in good condition. Well mown lawns, trimmed and tidy edges and hedges, neat and well weeded beds are of first importance in any public garden. The public responds to such surroundings; and remarkably little damage is done and very little litter left even by the large numbers of people who visit the Gardens at weekends and on holidays.

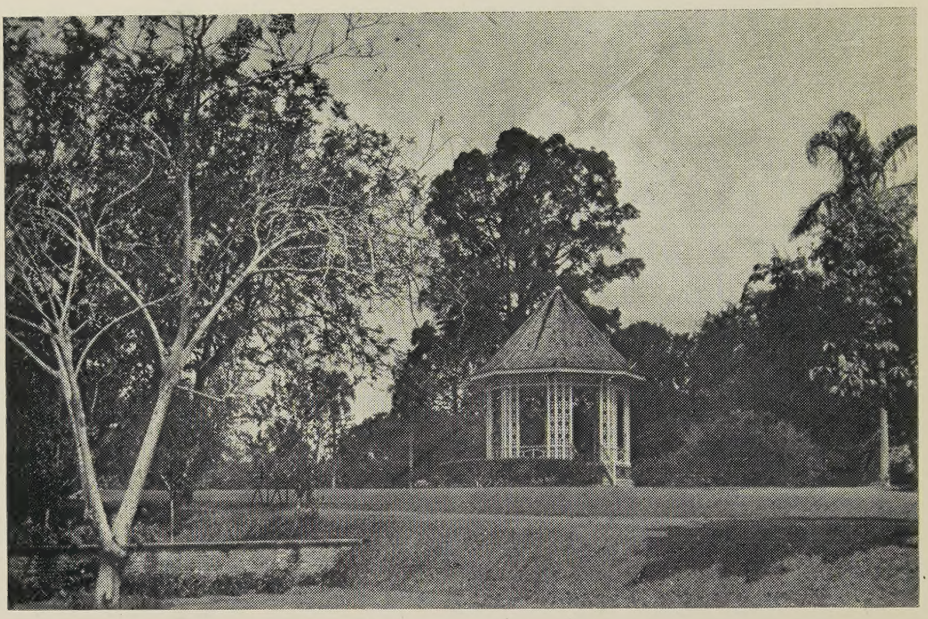
ROADS, PATHS AND DRAINS

No work was done on the roads or paths by the Public Works Department. In July the level of the Lake was lowered to allow the mason to rebuild 14 feet of the channel feeding the Lake. A footbridge of nibong palm was constructed over this channel. Small repairs to drains and water channels were done by the mason.

M. R. Henderson

Above: *Portlandia grandiflora,* a Tropical African shrub.

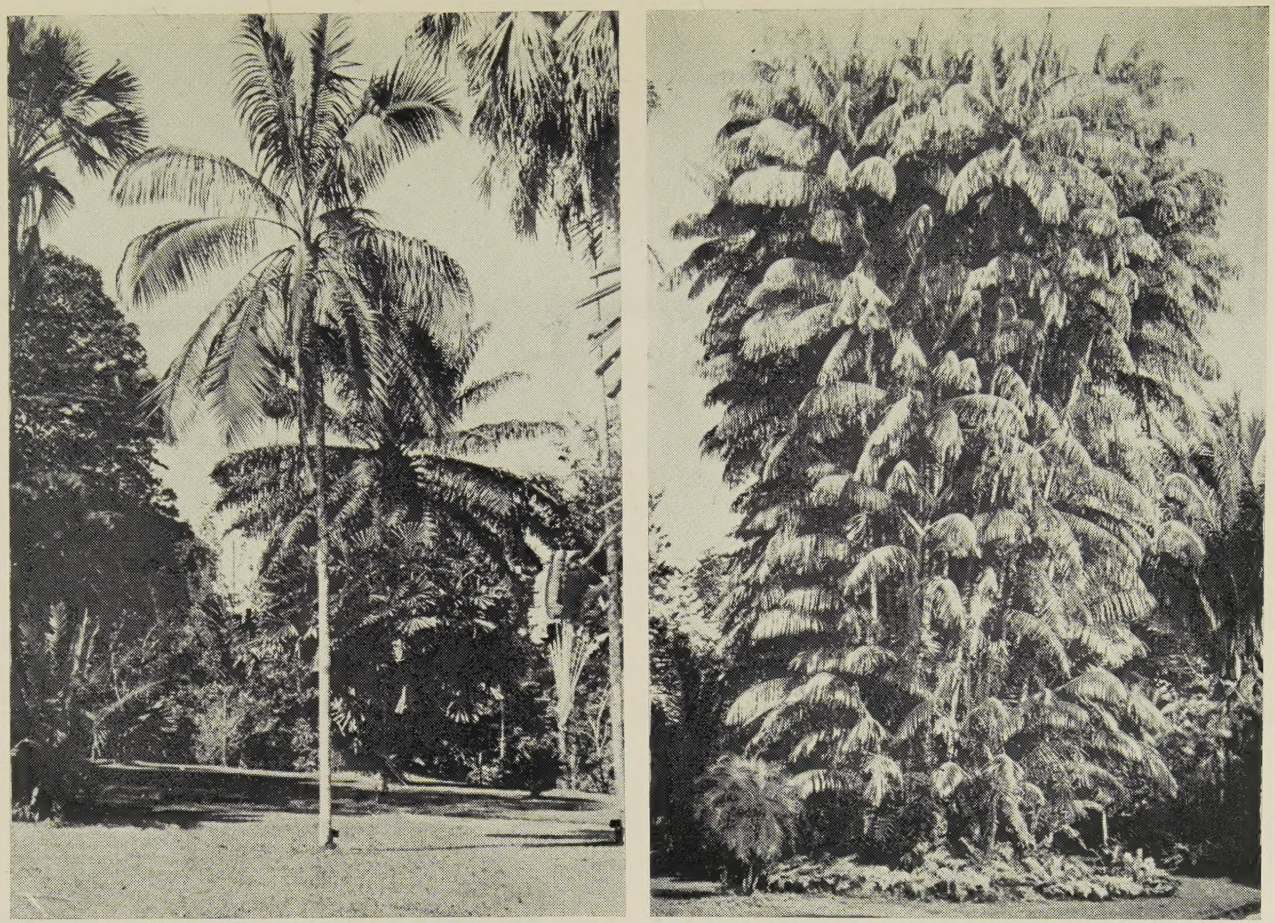
Below: *Fagræa auriculata,* a Malayan plant with very large, leathery, cream coloured flowers.



M. R. Henderson

Above: The Bandstand, Botanic Gardens; in the background a large tree of *Dyera costulata* (Jelutong); on the left a tree of *Cochlospermum religiosum.*

Below: *Teysmannia altifrons.* a Malayan Palm.



M. R. Henderson

Above: In the Palm collection in the Botanic Gardens.
On the left: *Heterospathe elata* from Ceram, with behind it a large African Oil Palm. On the right: A fine clump of *Oncosperma tigillaria* (Nibong), native on the seacoasts of Malaya.

M. R. Henderson

Above: *Phalænopsis Schilleriana,* a Philippine orchid.
Below: *Dendrobium John Nauen,* a fine hybrid raised in the Botanic Gardens Singapore. The flowers are white with an orange patch on the lip.

New reinforced concrete tanks for storage of water were built on Lawn T for the orchids and on Lawn X for flowering pot plants, replacing old and unsightly iron drums.

A series of compost bins was constructed on Lawn Z alongside Palm Valley Road, in a position which allows easy loading and unloading of them by the lorry. These bins have proved satisfactory and have turned out considerable quantities of good compost. The present temporary construction of nibong posts and wire netting will be replaced by brickwork as opportunity offers.

BEDS AND BORDERS

The Lantana border planted on Lawn O in 1950 proved less satisfactory than was expected and was removed and replaced by a mixed planting of dwarf shrubs and herbaceous perennials, which is more attractive.

Ixoras from three beds above the plant house were removed to form a hedge on Lawn Z below the Assistant Director's quarters. The beds were remodelled and planted with orange and yellow *Crossandra undulæfolia.*

A new border was made on Lawn L near the office to accommodate the Duranta collection. The Durantas in the border at the eastern end of Lawn O, having become much too big, were removed, the border dug and heavily manured and planted with a collection representing all the Ixoras in cultivation in the Gardens, with between them groups of herbaceous perennials and dwarf shrubs.

In the centre of the lawn near this border the large round bed of *Euphorbia pulcherrima* (Poinsettia), which was becoming untidy, was reduced in size and planted with seedling *Platycodon grandiflorus,* a Campanula-like plant, which made an unusual and attractive display.

The collection of standard Hibiscus surrounding the Sundial Terrace was lifted, manured and replaced, and the plants were improved by this treatment.

A collection of Pitcairnea was planted in a suitable border on Lawn O.

Thirteen species of Strophanthus, mainly African in origin, some of which may have economic possibilities, were put out on Lawn R, but so far growth has been unsatisfactory.

The Cannas bordering Main Gate Road on Lawns A and B were replanted in January and provided a good display until August, when growth became less vigorous. They were then top dressed with cattle manure and continued to provide a reasonable display of colour until the end of the year.

PLANT HOUSE

The plants here were maintained in good order by regular manuring and replacement when necessary. The small planthouse was never without a varied display of orchid hybrids.

THE LAKE

The Lake was cleaned in July when the level was lowered to allow the construction of a new inlet channel. Periodical weeding is done from a boat and this keeps in check the growth of Hydrilla and other water weeds. The Gouramy fish mentioned in the 1950 report as a reputed check on Hydrilla have not yet been obtainable.

ORCHIDS AND SUCCULENTS

The orchid section was extended considerably during the year and more beds for Vanda, Arachnis, Aranda and other terrestrial types were made. Many of the older beds had to have the compost completely renewed and it was found more satisfactory to use very coarse, half-rotted compost which does not break down into dust so quickly.

The number of flasks of seedlings has continued to increase, with over one thousand on the laboratory racks at the end of the year. The number of seedlings in pots has increased in proportion, but without a corresponding increase in space to house them. It was found necessary to dispose of surplus seedlings by sale, to which there was an immediate and enthusiastic response from local amateur and professional growers. The seedlings sold are all well established and of known parentage.

Some fifteen new hybrids were selected during the year as worthy of being kept and named. One was given the name *Aranda City of Singapore,* as it is a large, handsome plant which flowered for the first time a few days before Singapore was raised to the status of a city. It is a cross between *Vanda Dearei* and *Arachnis flos-æris* var. *insignis,* but although the flowers are large and of good colour and form, it appears not to be free flowering, for it has taken ten years to produce its first blooms.

Of the new Vandas, *Vanda Ruby Prince* is the most spectacular, with its deep cyclamen-purple flowers. It is the result of a cross between *Vanda Cooperi* var. *Cho Yam Neo* and *Vanda Ruby,* and is an improvement on both its parents. Two good new Dendrobiums flowered, one called *D. Champagne,* in which some of the seedlings have flowers of an unusual clear yellow; the other called *D. Lim Chong Min,* with large flowers, up to 4 inches across, of a clear orchid pink.

A number of strap-leaved Vandas, generally grown in pots, were planted out in compost beds as an experiment. They have done remarkably well under these conditions, especially *Vanda limbata,* which in pots flowered very occasionally, but in a bed made vigorous growth and flowered almost continuously. Other such Vandas tried out in this way were *V. Dearei, V. sumatrana, V. Trisum, V. Kapoho, V. suavis, V. tricolor* and *V. luzonica.*

A number of Hawaiian orchid hybrids have been obtained in exchange for Singapore plants and of these several have flowered. The most spectacular is undoubtedly *Vandanthe Rothschildiana,* which has grown and flowered vigorously, producing inflorescences of large, shapely, mauve-blue flowers, with as many as fourteen flowers open at a time. This is a cross between *Euanthe Sanderiana* and *Vanda cærulea,* neither of which can be grown with any success in Singapore.

The succulent collection has been maintained and increased both by new acquisitions and by propagation of existing material. *Stapelia hirsuta, Stapelia glabricaulis, Echinocactus setispinus, Eriocereus Harrissii* and *Glottiphyllum erectum* all flowered during the year. Scale and mealy bug are the chief pests on the succulents but neither has become serious and they can be kept in check by regular weekly sprayings with insecticide.

The collection of Saintpaullias (African Violets) was added to by the introduction of a white variety and a pink one from the Royal Botanic Gardens, Kew.

MISCELLANEOUS

The only new introduction worthy of mention is a white Bougainvillea which was obtained from the Botanic Gardens at Durban through the kind offices of Mr. E. F. Allen. It arrived here towards the end of 1950 and began to flower early this year as a pot plant. It was exhibited at the 1951 Flower Show and attracted considerable attention. It has proved easy to propagate; but none of the specimens planted out in the ground, although they are growing vigorously, have shown any signs of flowering.

Experiments were begun, rather late in the year and unfortunately during a period of very wet weather, to test the theory that ploughing and digging are unnatural and that crops should be grown in a layer of compost on undisturbed soil. Two beds of the same area and close together were prepared, one dug to a depth of two feet, heavily dressed with well rotted cattle manure and compost and raised about 9 inches above ground level, the other prepared by lifting the turf without disturbing the soil below and packing about $2\frac{1}{2}$ inches of fine compost on top. Long beans were selected as the trial crop as they are quick growing and the produce is easy to weigh accurately. The beans grown in compost matured more quickly and yielded a slightly heavier crop, 16 lb. 2 oz., as against 14 lb. $1\frac{3}{4}$ oz. in the normal bed. The earlier maturing would be a decided advantage in a climate with a restricted growing season, but less so in the wet tropics. There is an obvious advantage in being able to do away with digging, but a good supply of good compost must be available. The experiments are continuing with other vegetable crops and with herbaceous flowering annuals and perennials.

NURSERY

The nursery has been maintained satisfactorily and sufficient plants grown to meet the demands of the Gardens, plant sales, plant exchanges, etc.

At the head of the nursery it was found that in an overgrown thicket there were several cocoa trees which old records indicate are those introduced in 1879. The thicket was cleared, except for overhead shade, and the trees manured, to which their response has been good.

PLANT SALES

Revenue from plant sales was $16,216, of which $10,500 resulted from the sale of orchids. 19,993 miscellaneous plants and 2,702 orchids were sold.

PLANTS INWARDS AND OUTWARDS

773 packets of seed and 196 plants were received in exchange. 208 packets of seed were purchased. 2,238 packets of seed, 83 orchid plants and 84 other plants were despatched in continuation of our exchanges with other institutions and with individuals.

SINGAPORE FLOWER SHOW

Mr. G. Alphonso, Horticultural Assistant, was assistant Show Manager at the annual Flower Show sponsored by the Singapore Gardening Society. The Gardens staged a large exhibit, mainly of orchids, and Mr. J. L. Pestana, Laboratory Assistant, arranged an exhibit to demonstrate the parentage of orchid hybrids raised in Singapore.

GOVERNMENT HOUSE DOMAIN

The concrete plant house built during the Japanese occupation on the lawn in front of Government House was demolished and a lily pool constructed on the same site. The demolition and new construction were done by the Public Works Department, while the staff of the Domain completed the levelling, turfed the area and extended the existing rock garden to surround the pool. Two pergolas, one on either side of the pool, were put up by the P.W.D. and on them were planted Clematis and *Mucuna Bennettii.*

A sufficient stock of plants in pots was maintained to enable them to be changed twice a week in Government House and other residences in the Domain.

Various new plantings were made, including *Pleiocarpa mutica,* a West African plant which flowers profusely in Singapore but which does not set seed and defies attempts to propagate it vegetatively. A plant of it was got from Kew and put out in the rectangle behind Government House, where it has made good growth.

A few old trees were lost during the year. A very fine large Angsana near the back drive had to be severely pruned after a large branch had broken off during a storm. Fortunately the stump has sent out vigorous new shoots and the tree may eventually regain some of its former glory.

NATURE RESERVES

Important and timely legislation the Nature Reserves Ordinance No. 15 of 1951, came into force early in the year, providing for the dedication and administration of certain lands in the Colony of Singapore as Nature Reserves. These lands include the former reserves at Bukit Timah, Kranji and Pandan, as well as the water catchment areas in the centre of the island and the cliff at Labrador, and are administered by trustees who constitute a Board of Management with the Director of Gardens as Chairman.

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